

PATENT APPLN. NO. 09/995,863
AMENDMENT UNDER 37 C.F.R. §1.312

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IN THE CLAIMS:

1. (previously presented) A method for fabricating an electrode for lithium secondary battery, comprising the steps of:
roughening a surface of a metallic foil through wet-etching;
and

depositing a thin film by sputtering, CVD, vacuum evaporation, thermal spraying, electric plating or electroless plating on the roughened surface of the metallic foil, which is a current collector, so as to form irregularities on the surface of the thin film corresponding to irregularities on the roughened surface of the metallic foil, the thin film being any one of an amorphous silicon thin film, a microcrystalline silicon thin film, an amorphous germanium thin film, a microcrystalline germanium thin film, an amorphous silicon-germanium alloy thin film, and a microcrystalline silicon-germanium alloy thin film; and

forming gaps in the thin film in a manner to extend in its thickness direction from valleys of the irregularities of the thin film surface when the thin film is expanded and shrunk due to a charge/discharge reaction.

2. (original) The method for fabricating the electrode for lithium secondary battery according to claim 1, wherein surface

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roughness Ra of said surface of the metallic foil is made to be 100 nm or more through said wet-etching.

3. (original) The method for fabricating the electrode for lithium secondary battery according to claim 1, wherein said wet-etching is the etching using a hydrochloric acid based etchant.

4. (original) The method for fabricating the electrode for lithium secondary battery according to claim 1, wherein said metallic foil is a nickel foil.

5. (original) The method for fabricating the electrode for lithium secondary battery according to claim 4, wherein said nickel foil is a rolled nickel foil.

6. (previously presented) The method for fabricating the electrode for lithium secondary battery according to claim 1, further comprising the step of forming an interlayer on the roughened surface of said metallic foil prior to depositing the thin film.

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7. (original) The method for fabricating the electrode for lithium secondary battery according to claim 6, wherein said interlayer contains a component to be diffused into said thin film.

8. (original) The method for fabricating the electrode for lithium secondary battery according to claim 6, wherein said interlayer is a copper layer.

9. (canceled)

10. (currently amended) A method for fabricating an electrode for lithium secondary battery, comprising the steps of:

roughening a surface of a metallic foil to be used as a current collector by spraying particles on the surface of the metallic foil to collide the particles with the surface; and

depositing a thin film by sputtering, CVD, vacuum evaporation, thermal spraying, electric plating or electroless plating on the roughened surface of the metallic foil, which is a current collector, so as to form irregularities on the surface of the thin film corresponding to irregularities on the roughened surface of the metallic foil; ~~and forming gaps in the thin film in a manner to extend in its thickness direction from valleys of the~~

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~~irregularities of the thin film surface when the thin film is expanded and shrunk due to a charge/discharge reaction,~~ the thin film being any one of an amorphous silicon thin film, a microcrystalline silicon thin film, an amorphous germanium thin film, a microcrystalline germanium thin film, an amorphous silicon-germanium alloy thin film, and a microcrystalline silicon-germanium alloy thin film; and

forming gaps in the thin film in a manner to extend in its thickness direction from valleys of the irregularities of the thin film surface when the thin film is expanded and shrunk due to a charge/discharge reaction.

11. (original) The method for fabricating the electrode for lithium secondary battery according to claim 10, wherein said metallic foil is made of copper, iron, nickel, tantalum, molybdenum, or tungsten, or an alloy containing at least one of these metals.

12. (original) The method for fabricating the electrode for lithium secondary battery according to claim 10, wherein the maximum diameter of said particles is between 10 μm and 150 μm .

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13. (canceled)